Intra-segmental timing in sound change: /aw/ in Philadelphia

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Intra-segmental timing in sound change /aw/ in Philadelphia

**Intro**

Philadelphia (Labov et al 2013)

- /aw/ raising and fronting 1900
- /aw/ lowering and backing 1950
- today

Formant Trajectories

Have been investigated with generation as a categorical variable. Jacewicz, Fox & Salmons (2011)

- Wholistic measures compared against continuous variables. Rudal & Kohn (2014)
- With GAMs, it is possible to model trajectories against continuous variables. Wood (2006)

**Methods**

**Data**

- Philadelphia Neighborhood Corpus
- 19,517 tokens of pre-oral /aw/
- 279 white speakers

**Modelling**

- Generalized additive models & tensor product smooths
- outcome (F1)

**Predictors**

- All non-linear effects and interactions between
  - gender
  - log2(duration)
  - date of birth
  - measurement point
- Random intercepts
  - speaker
  - word
- Random smooths
  - measurement point
  - by speaker

**Results**

**formant tracks**

- Falling F2 & single F1 excursion at midpoint (diphthong)

**vowel space trajectories**

**max F1 excursion**

- Timing of F1 maximum shifts diachronically
- Target of F1 maximum is more stable

They interact with duration differently, over time

**F1 relative to F2**

- Delayed F1 maximum keeps F2/F1 difference larger for longer

**Conclusion**

It is not straightforward to characterize /aw/ as a 2 part diphthong in Philadelphia.

Along with the shifts in vowel quality, there is a considerable shift in relative timing of vowel formant targets.

This puts /aw/ in line with some consonantal phonetic changes, such as Scottish derhoticization or Andalusian post-aspiration.

**Further directions**

Evaluating and improving quality of automated full formant track extraction.

Incorporating more linguistic (nasals) and social (education) factors into analysis.

Are the F1 and F2 qualities used differently for linguistic or sociolinguistic perception?

**References**


Labov, W., & Rosenfelder, L. (2007). Tone tools and methods for very large scale measurements of very large corpora.


